

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated July 30, 2007. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1-24 and 27-46 stand for consideration in this application, wherein claims 1-4, 12-15, and 27-28 are being amended. All amendments to the application are fully supported therein. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Interview Summary

An interview was conducted with the Examiner Dismery E. Mercedes on January 28, 2008.

During the interview, it was agreed that the proposed claim amendments overcame the objections to claims 2, 3, 13, 14, 27 and 28, and the Examiner withdrew these objections. In connection with the withdrawal of the objection to the claims, the Examiner held that claims 27-28 and their dependent claims 29-42 would be allowable. The Examiner reasserted that claims 2-5 and 13-16 would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

With respect to the rejection of claims 1, 6-12, 17-24, and 43-46, agreement was not reached during the interview.

Formal Objections

Claims 2, 3, 13, 14, and 27-28 was objected to on the grounds of informalities. Applicants respectfully traverse this objection with respect to the use of the references "k" and " α " recited in claims 2, 3, 13, 14, and 27-28 on the grounds of no formula being associated or presented with "k" and " α ".

The reference "k" recited in claims 2, 3, 13, 14, 27, and 28 is an integer indicating a bit interval. The reference " α " recited in claims 2, 3, 13, 14, 27 and 28 is a coefficient that is a real number. The use of "k" and " α " as recited in claims 2, 3, 13, 14, 27 and 28 is an

universal and proper mathematical expression. Therefore, Applicants respectfully believe that the use of “k” and “α” as recited in claims 2, 3, 13, 14, 27 and 28 is proper.

With respect to the other aspects pointed out by the Examiner, claims 2, 3, 13, 14, and 27-28 are being amended so as to meet formal requirements.

Accordingly, withdrawal of this objection is respectfully requested.

Prior Art Rejections

The First 35 U.S.C. §103(a) Rejection

Each of claims 1, 6-8, 12, 17-19, 23-24, 43, and 45 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Dudley et al. (U.S. Patent No. 5,583,706) in view of Mallary et al. (U.S. Patent No. 6,359,744). These rejections are respectfully traversed for the reasons set forth below.

Claim 1

An apparatus as recited in claim 1 is directed to a magnetic recording/reproducing apparatus for perpendicular magnetic recording. The process of a DC component in a perpendicular magnetic recording system is different from that in a longitudinal magnetic recording system. In the perpendicular magnetic recording system, a DC component is to be detected because it may include data. In an apparatus as recited in claim 1, a reproduced signal outputted from a reproducing head for the perpendicular magnetic recording system is processed through a partial response equalization circuit. The partial response equalization circuit has a frequency characteristic so that a low-frequency component of the reproduced signal including a direct current component is partially suppressed but not completely cut off through the partial response equalization circuit. Namely, the partial response equalization circuit intentionally retains a DC component including data to be detected in a reproduced signal outputted from the head. The signal retaining the DC component is supplied to a maximum-likelihood decoder in order to detect the data in the DC component.

In contrast, Dudley says nothing about a perpendicular magnetic recording system, as admitted by the Examiner. This means that Dudley is directed to a longitudinal magnetic recording system. In the longitudinal magnetic recording system, a DC component is processed as a disturbance factor, and therefore, it has to be removed. Indeed, Dudley states that a DC offset included in the analog signal accentuates errors between the read signal sample values and the estimated sample values, and thereby degrades the performance of gain

control, and also reduces the effective range of the sampling device such as an A/D converter (col. 5, lines 32-34, lines 40-42). In order to solve the above-mentioned adverse effects of a DC offset, Dudley shows adjusting a DC offset in the analog read signal from a magnetic read head in a negative feedback loop (col. 6, lines 7-24, and 45-50, Figs. 3-6). In Dudley, a decimation filter adds the sample values from a positive pulse to the sample values of a negative pulse in order to detect and pass a DC offset without distorting the read signal. (col. 6, lines 15-19 and 44-48). The DC offset is passed and provided to a DC control loop so that the DC offset is subtracted from the signal at an adder G102. This means that the signal containing no DC component or DC offset is inputted to a discrete equalizer filter 26, and then, to a discrete time sequence decoder 34. Indeed, Dudley does not show or suggest that a DC component is partially suppressed but not completely cut off through the partial response equalization circuit as in the present invention.

The secondary reference of Mallary fails to provide any disclosure, teaching or suggestion that makes up for the deficiencies in Dudley. Therefore, at the time the invention was made, one of ordinary skill in the art would not and could not achieve all the features as recited in claim 1 by combining Mallary with Dudley.

Furthermore, although Mallary is directed to a perpendicular magnetic recording system, Dudley is directed to a longitudinal magnetic recording system. As set forth above, the perpendicular magnetic recording system uses a DC component as a part of a signal including data to be detected, while the longitudinal magnetic recording system needs to remove a DC component completely because of the adverse effects it will cause. Therefore, one of ordinary skill in the art would not have combined Dudley's system including a feedback loop for removing DC component from a signal prior to a discrete equalizer filter and a discrete time sequence decoder with Mallary's perpendicular magnetic recording system, because to do so would have destroyed the operability and utility of Dudley or Mallary.

In sum, at the time the invention was made, one of ordinary skill in the art would and could not achieve all the features of the invention as recited in claim 1 in view of Dudley and Mallary. Accordingly, claim 1 is not obvious in view of all the prior art cited.

Claim 12

Claim 12 has substantially the same features as those of claim 1, at least with respect to a reproduced signal outputted from said reproducing head being processed through a

partial response equalization circuit having a frequency characteristic so that a low-frequency component of said reproduced signal including a direct current component is partially suppressed but not completely cut off through said partial response equalization circuit, and said reproduced signal outputted from said partial response equalization circuit being supplied to a maximum-likelihood decoder so as to be data-reproduced. As such, the arguments set forth above are equally applicable here. Claim 1 being allowable, claim 12 must also be allowable.

Claims 6-8, 17-19, 23-24, 43, 45

As to dependent claims 6-8, 17-19, 23-24, 43, and 45, the arguments set forth above with respect to independent claims 1 and 12 are equally applicable here. The corresponding base claim being allowable, claims 6-8, 17-19, 23-24, 43, and 45 must also be allowable.

The Second 35 U.S.C. §103(a) Rejection

Each of claims 9, 20, 44, and 46 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Dudley in view of Mallary, further in view of Ziperovich (U.S. Patent No. 5,459,679). These rejections are respectfully traversed for the reasons set forth below.

As set forth above, the combination of Dudley and Mallary fails to teach all the elements recited in claims 1 and 12, from which claims 9, 20, 44, and 46 depend. The secondary reference of Ziperovich fails to provide any disclosure, teaching or suggestion that makes up for the deficiencies in the combination of Dudley and Mallary. Therefore, at the time the invention was made, one of ordinary skill in the art would and could not achieve all the features as recited in claims 1 and 12, from which claims 9, 20, 44, and 46 depend.

Accordingly, claims 9, 20, 44, and 46 are not obvious in view of all the prior art cited.

Allowable Subject Matter

In response to the telephone inquiry on January 16, 2008, the Examiner admitted that the condition for the allowability of claims 27-28 are incorrect and claims 27-28 would be allowable if the objection to claims 27-28 is overcome.

Applicants thank the Examiner for holding during the interview that claims 27-28 and their dependent claims 29-42 would be allowed because the objection to claims 27-28 is overcome. As set forth above, claims 27-28 are being amended so as to overcome the

objection. allowance of claims 27-28 and there dependent claims 29-42 are respectfully solicited.

Applicants further thank the Examiner for holding that claims 2-5 and 13-16 would be allowed if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. However, as to dependent claims 2-5 and 13-16, the arguments set forth above with respect to independent claims 1 and 12 are equally applicable here. The base claim being allowable, claims 2-5 and 13-16 must also be allowable in the form of a dependent claim.

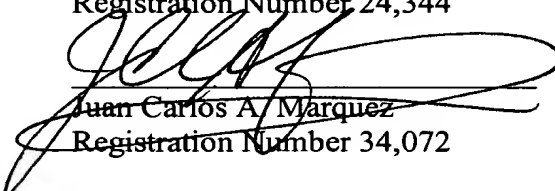
Conclusion

In light of the Amendments and Remarks, Applicants respectfully request early and favorable action with regard to the present application, and a Notice of Allowance for all pending claims is earnestly solicited.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

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